A Hybrid SiN-QDOT Platform for Visible Photonics

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Abstract: We developed a hybrid SiN-QDOT platform by embedding quantum dots in a SiN waveguide. Low loss waveguiding, high modal gain and lasing from mikrodisk and DFB-type devices was demonstrated.

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OCIS codes: (230.3120) Integrated optics devices; (220.0220) Optical design and fabrication; (230.6080) Sources; (140.3945) Microcavities

1. Introduction to the style guide, formatting of main text, and page layout

In the past few years, a variety of chemically synthesized colloidal quantum dots (QDs) and their 2D counterparts, colloidal platelets, have been shown to exhibit optical gain at wavelengths that can be readily adjusted from near infrared to visible wavelengths through size quantization and material choice. In that sense they match very well to silicon nitride waveguides, which are transparent from the UV to the MIR. Combining these two, we developed a low loss hybrid SiN-QDOT platform [1] [2] [3] and demonstrated lasing from mikrodisk and DFB-type devices [4] [5] . We also demonstrated controlled placement of individual QDOTs [6] , opening up a route towards the realization of integrated single photon sources [7] [8] .

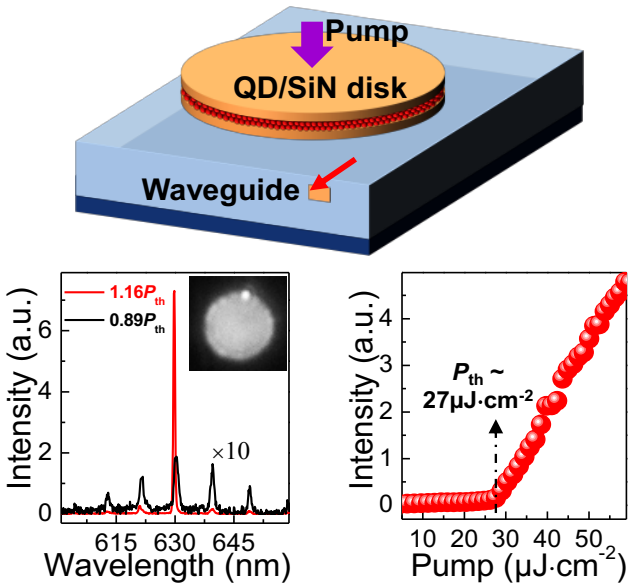

Figure 1 Sketch of the mikrodisk laser, emission spectrum (below and above threshold) and LL-curve [4]

4. References

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